

Claims

- [c1] 1. A method for determining a production plan comprising:
 - allocating resources to different priorities by iteratively solving mathematical linear programs, wherein each mathematical linear program optimizes according to one of a plurality of sets of priorities wherein each set contains a plurality of priorities, and
 - each iterative solution is consistent with the previous solution.
- [c2] 2. The method of claim 1, wherein said priorities are hierarchical and comprises two or more levels of hierarchy.
- [c3] 3. The method of claim 1, wherein backorder costs penalties are determined independently for each set of priorities and comprise a full spectrum range within each set of priorities.
- [c4] 4. The method of claim 1, wherein said mathematical linear programs solved in each iteration use the solution to the previous mathematical linear program as a starting point.

- [c5] 5. The method of claim 1, further comprising adding constraints to said mathematical linear programs at each iteration to ensure that solutions to subsequent iterations are consistent with previous solutions.
- [c6] 6. The method of claim 1, wherein said method uses a different mathematical linear program for each iteration.
- [c7] 7. The method of claim 1, wherein said allocating process solves said mathematical linear programs for higher priorities before solving for lower priorities.
- [c8] 8. A method of allocating resources to a hierarchy of demand priorities in a linear programming production planning system, said method comprising:
 - aggregating said demand priorities into different priority groups;
 - allocating said resources to the highest priority group of demand priorities using a first linear programming model;
 - allocating remaining resources to the next highest priority group of demand priorities using a second linear programming model, wherein said second linear programming model uses results from said first linear programming model; and
 - iteratively repeating said process of allocating re-

maining resources to the remaining groups of demand priorities in order of priority.

- [c9] 9. The method in claim 8, wherein when repeating said process of allocating remaining resources, said method uses a different linear programming model for each iteration.
- [c10] 10. The method in claim 9, wherein each different linear programming model uses results of the previous linear programming model.
- [c11] 11. The method in claim 8, wherein during said allocating processes, each linear programming model fixes variables associated with priority groups that have a lower priority than the priority group to which the resources are currently being allocated.
- [c12] 12. The method in claim 8, wherein during said allocating processes, each linear programming model allocates the full range of backorder costs within the priority group to which the resources are currently being allocated.
- [c13] 13. The method in claim 8, further comprising dividing said priority groups into different sub-priority tiers.
- [c14] 14. The method in claim 13, wherein said sub-priority

tiers can be processed simultaneously or separately.

- [c15] 15. A method of allocating resources to a hierarchy of demand priorities in a linear programming production planning system, said method comprising:
 - aggregating said demand priorities into different priority groups;
 - allocating said resources to the highest priority group of demand priorities using a first linear programming model;
 - allocating remaining resources to the next highest priority group of demand priorities using a second linear programming model, wherein said second linear programming model uses results from said first linear programming model; and
 - iteratively repeating said process of allocating remaining resources to the remaining groups of demand priorities in order of priority using a different linear programming model for each iteration.
- [c16] 16. The method in claim 15, wherein each different linear programming model uses results of the previous linear programming model.
- [c17] 17. The method in claim 15, wherein during said allocating processes, each linear programming model fixes variables associated with priority groups that have a

lower priority than priority group to which the resources are currently being allocated.

- [c18] 18. The method in claim 15, wherein during said allocating processes, each linear programming model allocates the full range of backorder costs within the priority group to which the resources are currently being allocated.
- [c19] 19. The method in claim 15, further comprising dividing said priority groups into different sub-priority tiers.
- [c20] 20. The method in claim 19, wherein said sub-priority tiers can be processed simultaneously or separately.
- [c21] 21. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform a method of allocating resources to a hierarchy of demand priorities in a linear programming production planning system, said method comprising:
 - aggregating said demand priorities into different priority groups;
 - allocating said resources to the highest priority group of demand priorities using a first linear programming model;
 - allocating remaining resources to the next highest

priority group of demand priorities using a second linear programming model, wherein said second linear programming model uses results from said first linear programming model; and iteratively repeating said process of allocating remaining resources to the remaining groups of demand priorities in order of priority.

- [c22] 22. The program storage device in claim 21, wherein when repeating said process of allocating remaining resources, said method uses a different linear programming model for each iteration.
- [c23] 23. The program storage device in claim 22, wherein each different linear programming model uses results of the previous linear programming model.
- [c24] 24. The program storage device in claim 21, wherein during said allocating processes, each linear programming model fixes variables associated with priority groups that have a lower priority than the priority group to which the resources are currently being allocated.
- [c25] 25. The program storage device in claim 21, wherein during said allocating processes, each linear programming model allocates the full range of backorder costs within the priority group to which the resources are cur-

rently being allocated.

- [c26] 26. The program storage device in claim 21, wherein said method further comprises dividing said priority groups into different sub-priority tiers.
- [c27] 27. The program storage device in claim 26, wherein said sub-priority tiers can be processed simultaneously or separately.